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ABSTRACT

A community-focused health promotion program for older adults was planned and implemented in Fairfax County, Virginia. A needs assessment was conducted to determine the social health problems and behavior patterns of the older adults in the community. After analysis of factors that may impinge upon the decision-making processes of those who might engage in a health program, it was decided that a program of regular exercise would be most conducive to achieving a healthier lifestyle. The characteristics of such an innovation were examined, including compatibility with past experiences and values, difficulty with understanding the benefits of exercise, the extent to which it may be tried on a limited basis, advantages, impact on social life, and risk or uncertainty. In an educational diagnosis of factors related to older adults, the factors of attitudes and beliefs, resources and necessary skills to perform, and attitudes and behaviors of peers were explored. A description is presented of the educational strategies selected for the program, and a brief evaluation of the program's progress is given. (JD)

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# HEALTH EDUCATION AND PHYSICAL FITNESS FOR OLDER AMERICANS

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My colleagues and I would like to describe for you this afternoon how the three year Health Education and Physical Fitness Project for Older Adults (the HEP project) evolved at George Mason University in Fairfax County, Virginia.

The Project has launched the newly established Center for Health Promotion as a visible, major actor in health promotion in our community of 600,000 persons. It has given us a fairly unique role to play, one in which we have been able to avoid the role of competitor with other service providers.

We will present this project, which is funded by the Virginia Department of Health, as a case study in the planning, implementation and evaluation of a community-focused health promotion program for older adults using the PRECEDE model (14) (Slide 1). We believe it will be helpful to health education practitioners to see how we came to be involved with the problem of inactivity among the older adults.

THE SOCIAL PROBLEMS

At the urging of the County chairman of the Commission on Aging we started to look more closely at the problems of the older adult population in Fairfax County. We began by conducting a needs assessment to familiarize ourselves with the Fairfax County older adult community. We looked at existing data, surveyed readers of the Golden Gazette, a newsletter that reaches 20,000 older adult households in the county each month, and talked with service providers.

Fairfax County has 55,000 older people. Eight percent (8%) of the population is age 60 or older (21). The number of persons over 75 years of age has more than doubled in the last decade, mirroring the nationwide phenomenon of a rapidly aging society. Given that demographers are predicting that one in five persons may be elderly in another 50 years (24), communities like Fairfax must begin to look at the implications of this age shift in terms of quality of life for older adults. They must look, too, at the institutions that serve the elderly "since health and social service requirements for individuals change dramatically and rapidly after the age of 65" (19, 1).

Not surprisingly, one of the clear and emphatic desires we heard expressed by older adults in our community was that desire to remain independent while continuing to live useful and meaningful lives.

THE HEALTH PROBLEMS

Following the planning steps of the PRECEDE model we next searched for information about the health problems of older adults. According to Healthy People, four out of five older adults have one or more chronic conditions (16). The most prevalent conditions are shown in this slide (Slide 2). They are arthritis, hypertension, osteoporosis, heart conditions, diabetes, and impaired vision and hearing (10; 15; 16). The incidence of anxiety and depression among this age group occurs at a rate that rivals heart disease (9). Older adults are also at higher risk of accidents (19) and are likely to be overweight. Overmedication or polypharmacy is another important health

problem. The physician is much more likely to use pharmacological approaches in the treatment of health problems and symptoms of older patients. This increases the risk of iatrogenic disease and has the potential to diminish physical and intellectual vitality (21). Chronic disease and physical impairments also increase the risk of social isolation which has been shown to be a health risk (4).

THE BEHAVIORAL PROBLEM

The common behavioral thread that ties together most of the health problems I have just mentioned is inactivity. Sedentary lifestyle has been implicated as a major risk factor for chronic disease, either in the etiology of the condition, like osteoporosis or in its management, like high blood pressure or diabetes. Some of the benefits of exercise are depicted in Slide 3.

However, despite measures of physical activity that vary widely, surveys confirm that the elderly are least likely to be currently exercising (12). In fact, only about one in three older adults exercises regularly. Those who do are more likely to be males, to be better educated, to have higher incomes and higher status occupations (8; 12; 28).

EXERCISE AS AN INNOVATION FOR OLDER ADULTS

Before we move to the next step in the PRECEDE model it would be helpful, I think, to look for a few minutes at physical fitness as a

behavioral innovation for many elderly people, particularly elderly women. From this perspective it is easier to grasp the factors that may impinge upon the decision-making process of those people who are likely candidates for adopting a program of regular exercise. This slide (3) shows relevant characteristics of a behavioral innovation (Slide 4). Let me briefly review each with you.

1. Compatibility means to what extent are fitness recommendations compatible with an elderly person's past experiences and values. Women, for example, have much less experience with physical activities like sports than men. A strength building program desirable for preventing osteoporosis, or, for that matter, even perspiring may be perceived as unfeminine and therefore inappropriate by many women.

2. Complexity means "how difficult an innovation is to understand and use" (3, 21). Fitness has many dimensions, among them strength, flexibility, aerobic capacity, and balance. Encouraging older persons to adopt a "total fitness program" entails some explanation of these multiple dimensions of fitness and instruction in the skills involved to successfully execute various aspects of exercise such as heart rate monitoring.

3. Trialability refers to "the extent to which an innovation may be tried on a limited basis. Innovations which can be tried out may be perceived as more favorable than those which require initially a long-term commitment" (3, 21). Fortunately, most forms of exercise can be tried by most anyone on a limited basis, with a small investment in a

comfortable pair of shoes being the only requirement.

4. By relative advantage I mean "the degree to which an innovation is perceived as being better than the idea it supercedes" (26, 138). Increasingly, many elderly persons perceive physical fitness as the one thing that gives them more active control over their health and their ability to live independently. For them this is without question a positive alternative to expensive and frequently debasing medical care.

5. Observability refers to the extent to which people can see exercise being practiced and enjoyed by others their age. This makes the innovation tangible. Seeing other older adults involved in physical activity, particularly if those older adults are like themselves, is more likely to result in their adopting a program of regular physical fitness.

6. Impact on social relations is an aspect of an intervention that asks the question: to what extent will adopting a regular exercise program impinge on important or even routine social relationships? Any program that is too disruptive of an individual's social relationships will have a negative impact on adoption, while those that have a positive effect can promote adoption. A program that competes with the dinner hour, for example, may have difficulty sustaining enrollment.

7. Finally, there is risk and uncertainty. I believe this factor is of major importance to many older adults who may be interested in beginning an exercise program. Worry about aggravating an existing

health problem, falling, or incurring a heart attack or stroke are some of the factors that may appear on the negative side of an individual's decision balance sheet. In addition, physician ignorance about exercise frequently results in reluctance to prescribe exercise for their patients.

Using the PRECEDE planning model we examined the social and health needs of Fairfax County residents. That assessment, coupled with the fact that the Center for Health Promotion is located within a department of health and physical education, was instrumental in our decision to focus on exercise as the key behavior to be addressed by our elderly health promotion project. We established as our project goal to increase the number of older adults in Fairfax County who exercise on a regular basis.

THE EDUCATIONAL DIAGNOSIS

In order to develop an effective program, we had to determine why older adults do not exercise. We have already mentioned that exercise is an innovation for many elderly. I would now like to share with you some additional factors which appear to be related to inactivity in older adults by moving to the next stage of the PRECEDE model, the educational diagnosis.

Predisposing Factors

The first group of factors to consider in an educational diagnosis are the predisposing factors. They include knowledge, attitudes and beliefs older adults hold concerning exercise (Slide 5). As this slide

Enabling Factors

The next step in the educational diagnosis deals with enabling factors. Enabling factors include the resources and skills necessary to perform the desired health behavior. Some of the enabling factors necessary for performing exercise regularly are listed on my next slide. (Slide 6).

First, health status greatly influences participation in physical activity. Results from the Canadian Fitness Survey show that injury and ill health were cited as the most important barriers to exercise by those 55 and over (8). Although older adults shoulder a disproportionate burden of chronic disease, most of these diseases need not prohibit them from exercise and many, such as arthritis, may indeed be relieved by exercise. However, individuals who perceive their health status as poor or their health conditions as limiting, tend to remain inactive.

Not surprisingly, many older adults have no prior exercise experience and therefore have not developed the necessary skills to participate in these activities. The current cohort of older persons generally were not exposed to physical education programs in the schools which is predictive of physical activity in adulthood (24) and most women, unlike men, have little experience in active sports.

Another enabling factor is the availability and accessibility of exercise programs and facilities. One study found that older adults gave the availability of programs and appropriate facilities as

shows, many older adults are uninformed or misinformed about the benefits of exercise and the guidelines for safe and effective exercise (11). They believe their need for exercise diminishes with age while at the same time they overrate the benefit of light, sporadic exercise (6). Many feel that their daily activities provide them with enough exercise. In fact the National Adult Physical Fitness Survey found that only 39% of Americans aged 60 and over get enough exercise, yet 71% believe they get all the exercise they need (24).

Another belief held by older adults which makes many less predisposed to exercise is the belief that it is too late at their age to benefit from a program of regular exercise. This is especially problematic in light of Fishbein and Ajzen's Theory of Reasoned Action which posits that the belief that one's behavior will result in a valued outcome positively influences one's attitude toward that behavior (1). If older adults feel there are no benefits to be gained, they will be less likely to exercise.

Fishbein and Ajzen's theory also states that one's statement of intention to perform a certain behavior is a good predictor of that behavior occurring. Therefore, we hypothesized that those individuals who stated prior to the program that they would continue to exercise regularly after the program ended, would do so.

Two other predisposing factors which keep older adults from exercising are lack of confidence in exercise ability and fear of injury.

important reasons for becoming involved in exercise (27). Unfortunately, many older adults do not have transportation to reach exercise facilities and, even if they did, many of the available programs are not appropriate for them nor are the instructors experienced in leading exercise for older adults.

Reinforcing Factors

The third set of factors to consider in making an educational diagnosis related to this behavioral problem are the reinforcing factors. Reinforcing factors are those attitudes and behaviors of peers, significant others and health professionals which support or hinder an individual's health actions (Slide 7).

Studies show that the support of a spouse or significant other is a powerful determinant of an individuals's adherence to a program of regular exercise (2, 17). One study found that lack of spouse support was associated with a threefold increase in the dropout rate from an exercise program (2). Older adults in our community state that not having anyone to exercise with is a major factor which keeps them from exercise.

As older adults have a greater frequency of physician visits per year and are more likely to have multiple health conditions, the role of physician in prescribing exercise has great potential. In fact,

studies show that a physician's recommendation is the factor most likely to persuade inactive people to begin an exercise program and the only factor to increase in importance with age (8; 23). We speak about physician "potential", however, because a study conducted by the President's Council on Physical Fitness and Sports in 1972 found that four out of five Americans had never been advised by a physician to exercise (24). While we don't doubt that physicians are increasingly recommending exercise for their patients, our own data suggests that providers could take a much more active role.

Finally various studies have shown that the positive benefits brought about by exercise are powerful reinforcers of exercise behavior (5; 11).

SELECTION OF EDUCATIONAL STRATEGIES

After looking at factors which contribute to lack of exercise in older adults, it became apparent to us that a comprehensive health and exercise program was needed. HEP was designed as such a project.

In order to reach as many sedentary Fairfax County older adults as possible, four educational strategies were developed during HEP's first two years (Slide 8). They were: 1) public education 2) professional education 3) a peer training program and 4) a model exercise program.

For the public education component we developed a series of articles on exercise benefits, resources and approaches to behavioral change which were published in the Fairfax County Golden Gazette, which reaches 20,000 older adult households each month. We have also

made many presentations to senior and preretirement groups on exercise.

To reach recreation specialists, health care professionals and others, we have conducted two workshops on various aspects of older adult fitness programming.

Our peer training program was developed to train older adults as volunteer exercise leaders for senior sites throughout the county. This strategy was intended to: 1) meet the critical demand for qualified instructors, 2) to create free and accessible programs for the older adults in every area of our large populous county 3) to provide appropriate role models for older adult fitness.

The HEP Model Exercise Program, another educational strategy, is particularly illustrative of how critical predisposing, enabling and reinforcing factors were integrated into an effective educational intervention. The HEP Model Erercise Program meets at George Mason University twice weekly for two hours each session. Participants who range in age from 55 to 83 participate in a variety of flexibility, aerobic and strength-enhancing activities such as dance, weight training, tennis, pickleball, stretching, mat exercises, walking and golf.

In health educations seminars, information is presented on the benefits of physical activity to physical and mental health, cardiovascular fitness, weigh control and management of chronic conditions. Misconceptions and fears about exercise and guidelines for safe and effective exercise are discussed. Our program nurse monitors blood pressure and provides health counselling.

Through individual and group consultation participants learn exercise skills including correct techniques for executing movements to avoid injury, ways to adapt exercises to physical limitations and how to monitor heart rates.

Finally, the HEP Exercise Program includes strategies to reinforce the exercise behavior of its participants. Participants are encouraged to bring a spouse or friend along to serve as a key source of support for adhering to a regular exercise regimen. Persons new to exercise start with easily accomplished tasks to build confidence. HEP staff members provide encouragement and praise as appropriate. To supplement staff support participants are given feedback on their progress through physical assessments taken at regular intervals which are designed to make exercise benefits more visible and therefore more reinforcing.

PROGRAM EVALUATION

The study population for the 10-week pilot exercise program was self-selected. To qualify, participants had to be 60 or older, have physician consent to participate, and not be engaged in regular exercise at the time of enrollment. Approximately 20 percent of the 105 participants did not meet the age or exercise criteria, but were allowed to participate because they came as partners for people who qualified for the program. The demographic characteristics of program participants are portrayed in Slide 9. HEP participants had high educational levels, high incomes, most were married and all were white.

Although there are two small black communities near the university, no blacks volunteered for the program. This may have been due to the channels used to publicizing the program. For the most part HEP participants perceived themselves to be in good health. Because they volunteered for the program they also may have been more exercise aware than the average older adult.

Evaluation Research Component

The program evaluation research consisted of two different types of measures: questionnaires and measures of physical fitness (Slide 10). Pre-program and post-program questionnaires were administered to gather information on factors identified as predisposing, enabling, and reinforcing exercise. HEP Staff also conducted measurements of participants' beginning and ending fitness levels using 12-minute walk, grip strength, sit and reach, weight and pulse rate as indicators.

Analysis of the Evaluation Data

Analysis of the evaluation data was achieved in two steps. Compliance and behavioral measures were analyzed using multiple regression techniques to determine which variables would best explain exercise behavior. Physical assessments were analyzed using paired t-tests to determine whether changes in before and after measurements were significantly different for high and moderate program attenders.

The predisposing, enabling, and reinforcing factors were treated as independent variables to be regressed against the dependent

variable, exercise behavior. Wherever possible, questions that seemed to measure a common concept were developed into indices using Common Factor Analysis and Cronbach's Alpha. As a result of these two procedures, reliable and valid multiple indicators were created to act as some of the independent variables. When multiple indicators could not be constructed, individual questions or groups of questions were used as independent variables. The dependent variable, exercise behavior, was a composite of attendance in the program and reported frequency and duration of exercise undertaken outside the program.

Each independent variable was bivariately correlated to exercise behavior. The five variables that were significantly bivariately correlated to exercise behavior (p. 10) were: confidence in exercise ability, the actual benefits received during exercise, knowledge of frequency of exercise required for cardiovascular benefit, knowledge of intensity of exercise required for cardiovascular benefit and a commitment to exercise.

Results of the Multiple Regression Analysis

Bivariately correlated variables were then entered into a multiple regression analysis. The results of this multiple regression analysis are presented in Slide 11. The variable "confidence in exercise ability" which was significantly bivariately correlated to the dependent variable, exercise behavior, was not significantly correlated in the multiple regression equation. This indicates that the original

bivariate correlation was spurious. A more sophisticated path analysis might show which variables were acting on confidence in exercise ability to make it appear to be significantly related to exercise behavior. The Coefficient of Determination, $R^2$, (adjusted for the number of variables in the equation) indicates that this set of independent variables account for approximately 34% of the variance in exercise behavior. Beta weights, measures of the strength of each variable in explaining exercise behavior, show that the knowledge frequency variable is the strongest single explanatory variable for exercise behavior; beta equals .3434. The benefits received during exercise variable is the weakest explanatory variable for exercise behavior; beta equals .2054.

The significance of the two knowledge variables supports the contentions of various authors that knowledge of exercise is the first step toward changing exercise behavior (6; 7; 12; 18). The importance of reported commitment to continue exercising supports the ideas of Ajzen and Fishbein (1) that reported intent is a good indicator of action. The significance of the benefits of exercise variable reiterated the ideas of various authors that the positive changes brought about by exercise can positively influence exercise behavior (5; 11).

Changes in Physical Assessments

Changes in before and after physical assessments were analyzed using a paired t-test. This procedure tests the significance of the differences in the means of a pair of variables measured across the same set of cases. Results of the paired t-tests are presented in Slide 12.

Both the high and low attender groups experienced significant decreases in systolic blood pressure and significant increases in flexibility. High attenders decreased their systolic blood pressure an average of 14 points; low attenders decreased their systolic blood pressure an average of 6 points. High attenders increased their flexibility by an average of 9 cms; low attenders increased their flexibility by an average of 6 cms. High attenders experienced a significant reduction in diastolic blood pressure (an average of 3 points), a significant reduction in weight (an average of one pound), and a significant increase in endurance (an ability to walk an average of one additional lap). Grip strength did not change significantly for the high attenders, but decreased significantly for low attenders, who lost an average of 3 pounds of grip strength.

SUMMARY

Dr. Robert Butler, former head of the National Institute on Aging, once said in effect that if we could pack exercise into a pill, it would be the most potent medicine we as a nation could possess. It has

been estimated that about half of the physical and mental decline that we associate with aging is the consequence of muscular disuse. So while exercise is no panacea, that is, there is no evidence that exercise can prevent us from growing old, it can do a great deal to prevent the premature aging associated with inactivity.

Unfortunately, many people view health promotion and risk reduction programs as inappropriate for the elderly, despite the fact that one third or more elderly will live a score of years beyond their 65th birthdays. The elderly are too often perceived as ailing and decrepit, requiring rehabilitation perhaps, but not seen as benefiting from prevention and health promotion. This misconception belies what we believe is the real objective of health promotion - to optimize the quality of our lives at any age. Health promotion and self-care activities like exercise may enable us to remain well and fully functioning until the very end of our natural lifespans.

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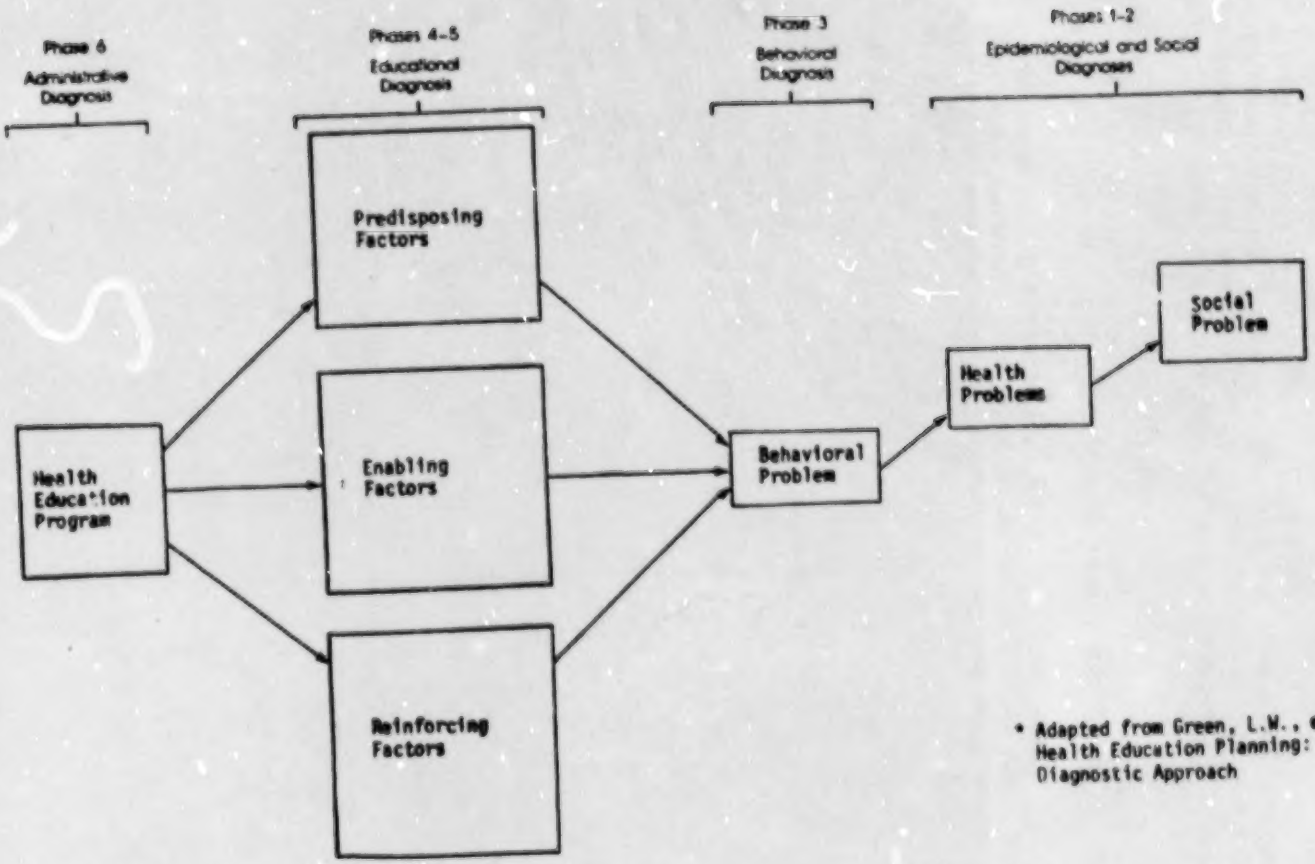
SLIDE 1

## The PRECEDE Framework




* Adapted from Green, L.W., et. al., Health Education Planning: A Diagnostic Approach

SLIDE 9

## DEMOGRAPHIC CHARACTERISTICS OF PROGRAM PARTICIPANTS

| | |
|---|---|
| **AGE** | |
| 50-64 | 52% |
| 65-74 | 42% |
| 75+ | 6% |
| **SEX DISTRIBUTION** | |
| Male | 37% |
| Female | 63% |
| **INCOME** | |
| $0 - $9,999 | 6% |
| $10,000 - $19,999 | 13% |
| $20,000+ | 81% |
| **MARITAL STATUS** | |
| Married | 78% |
| Single | 3% |
| Widowed | 14% |
| Divorced | 5% |
| **HEALTH STATUS** | |
| Excellent | 33% |
| Good | 60% |
| Fair/Poor | 7% |
| **EDUCATION** | |
| ≤12 years | 28% |
| College | 72% |
| **LIVING ARRANGEMENT** | |
| With Spouse | 76% |
| Alone | 16% |
| Friends/Family | 8% |

SLIDE 10

## PROGRAM RESEARCH/EVALUATION INSTRUMENTS

| Pre-Program Questionnaire (week 1) | Post-Program Questionnaire |
|---|---|
| Participant Demographics<br>Perceptions of Exercise Ability<br>Health Status<br>Support of Significant Others for Participation in HEP Program<br>Exercise Intention/Commitment to Exercise<br>Exercise Knowledge<br>Anticipated Benefits/Drawbacks of Exercising in the Program | Assessment of the Program<br>Actual Benefits and Drawbacks Encountered While Exercising in the Program<br>Exercise Knowledge<br>Self Reported Exercise Behavior |
| **Physical Assessments (week 1)** | **Physical Assessments (week 10)** |
| Systolic Blood Pressure<br>Diastolic Blood Pressure<br>Resting Pulse Rate<br>Stretch & Reach (Flexibility)<br>Grip Strength (Strength)<br>12 Minute Walk (Endurance)<br>Weight<br>Height | Systolic Blood Pressure<br>Diastolic Blood Pressure<br>Resting Pulse Rate<br>Stretch & Reach (Flexibility)<br>Grip Strength (Strength)<br>12 Minute Walk (Endurance)<br>Weight<br>Height |

SLIDE 11

MULTIPLE REGRESSION WITH PRE- AND POST-PROGRAM VARIABLES

| VARIABLE | PEARSON'S R | $R^2$ | $R^2$ CHANGE | BETA | F |
|---|---|---|---|---|---|
| Knowledge-Frequency | .4349 | .3337 | .1052 | .3434 | 9.729 |
| Knowledge-Duration | .2592 | .1995 | .0756 | .2302 | 4.788 |
| Commitment to Exercise | .3956 | .3941 | .0603 | .2965 | 5.580 |
| Actual Benefits of Exercise | .2464 | .2285 | .0289 | .2054 | 3.581 |

$R^2$ = .39412

$R^2$ = (Adjusted) = .34003

F = 7.28559 (significant at .000)

* significant at $\leq$ .05

** significant at $\leq$ .10